State of Illinois
Department of Transportation
Division of Highways
Springfield

SPECIFICATIONS
FOR
BITUMINOUS PREMIX FOR MAINTENANCE USE
OPTIMIX, SYLCRETE, UPM, QPR-2000, EZ STREET - PROPRIETARY
Serial Number: M 120-05

1. DESCRIPTION. The patching material shall be composed of a mineral aggregate, plant-mixed with a liquid asphalt and chemical additives from the suppliers of the proprietary mixtures. The bituminous material shall be capable of coating wet aggregates without stripping, and shall be available in various grades so that one such grade will enable a stockpile to remain pliable and workable at a temperature of -26 °C (-15 °F). The patching material shall be capable of maintaining adhesive qualities in patched areas which are damp or wet at time of application, and also after remaining in an uncovered stockpile for up to twelve (12) months.

2. MATERIALS. Control of the materials shall be in accordance with the general requirements of Section 106 of the current Standard Specifications for Road and Bridge Construction. A five kilogram (ten-pound) sample of the mineral aggregate and one-liter (one-quart) sample of the liquid asphalt shall be submitted to the Bureau of Materials and Physical Research, 126 East Ash Street, Springfield, Illinois, for performing the tests specified herein.

(a) Aggregate

All Coarse Aggregate used in the proprietary mixtures shall consist of crushed stone of Class B quality or better as defined in Article 704.01(a) & (b) of the above cited Standard Specifications.

(b) Bituminous Materials

The bituminous material shall be a formulation of the liquid asphalt blend prepared under the supervision of the proprietary mix supplier. It shall meet the requirements of ASTM D 2026 or ASTM 2027, whichever applies, modified as follows:

	OPTIMIX	QPR-2000	SYLCRETE EV	SYLCRETE VA	UPM	EZ STREET
ASTM D 92 Flash point (COC) °C (°F) - minimum	94 (200)	94 (200)	94 (200)	94 (200)	94 (200)	94 (200)
ASTM D 2170 Kinematic Viscosity 60 °C (140 °F) mm^2/s (cSt)	350-3000	300-4000	300-4000	300-4000	400-2500	280-400 (cPs)
ASTM D 95 Water % - maximum	0.2	0.2	0.2	0.2	0.2	---
ASTM D 402 Distillate % by Volume of Original Sample						
Temperature						
Distillate to 225 ºC (437 ºF)	0	0	0	0	0	0
Distillate to 260 ºC (500 ºF)	0-5	0-5	0-5	0-5	0-0.5	0-0.5
Distillate to 315 ºC (600 ºF)	0-21	0-25	0-25	0-25	0-18	8-50
Residue from distillation to 360 ºC (680 °F) % Volume by Difference	70-94	72-95	---	---	73-95	70-95
Residue Tests:						
ASTM D 2171 Absolute Viscosity 60 ºC(140 ºF) Pascal Seconds (Poises)	11.5-44.0 (115-440)	12.5-42.5 (125-425)	12.5-42.5 (125-425)	12.5-42.5 (125-425)	12.5-42.5 (125-425)	12.0-42.5 (120-425)
ASTM D 5 Penetration 25 °C (77 °F) 100 g, 5s - minimum	---	200	---	---	---	---
ASTM D 5 Penetration, modified with cone, 25 °C (77 °F) 150 g, 5s - minimum	200	---.	180	180	180	180
ASTM D 113 Ductility 21 ºC (70 ºF) 1cm/min. cm - minimum	---	---	100	100	---	100
ASTM D 113 Ductility 4 ºC (39 ºF) 1cm/min, cm - minimum	85	100	---	---	100	100
ASTM D 2042 Solubility in Trichloroethylene % - minimum	99.0	99.0	99.0	99.0	99.0	99.0

(c) Stripping Tests

The combined UPM and liquid asphalt shall also meet the following stripping tests:

(1) Stripping Tests: Dry Aggregate. Two-hundred grams of the air-dried aggregate passing the 12.5 mm (½-inch) sieve and retained on the 4.75 mm (No. 4) sieve shall be combined with 6.3 percent, by weight, UPM liquid asphalt and mixed in a

hemispherical metal dish with a stiff spatula for three to five minutes or until a uniform coating is obtained. Twenty-five grams of this material shall be immediately place in an oven at 60 °C, ± 3 °C (140 ºF, ± 5 ºF), for eighteen to twenty-four hours, after which it shall be thoroughly mixed and allowed to cool to room temperature. The sample shall then be immersed in water at a temperature of 49 °C, ± 3 °C (120 ºF, ± 5 ºF), and maintained at this temperature for twenty-four hours. At the end of this period, the area of the aggregate remaining coated shall be determined visually while the sample is still immersed in water. Surface coating of at least 90 percent must be retained on the aggregate. A test similar to the above using MC-250 shall be made for comparison.

(2) Stripping Test: Wet Aggregate. Two-hundred grams of the aggregate passing the 12.5 mm (½-inch) sieve and retained on the 4.75 mm (No. 4) sieve shall be immersed in water for twenty-four hours and the excess water drained off, leaving the aggregate surface wet. This aggregate shall be combined with 6.3 percent, by weight, UPM liquid asphalt and mixed in a hemispherical metal dish with a stiff liquid spatula for three to five minutes or until a uniform coating is obtained. Twenty-five grams of this material shall be immediately place in an oven at 60 °C, ± 3 °C (140 ºF, ± 5 ºF), for eighteen to twenty-four hours, after which it shall be thoroughly mixed and allowed to cool to room temperature. The sample shall then be immersed in water at a temperature of 49 °C, ± 3 °C (120 ºF, ± 5 ºF), and maintained at this temperature for twenty-four hours. At the end of this period, the area of the aggregate remaining coated shall be determined visually while the sample is still immersed in water. Surface coating of at least 90 percent must be retained on the aggregate. A test similar to the above using MC-250 shall be made for comparison. In estimating the percentage of area remaining coated, any thin or translucent area shall not be considered as being coated

Each of the following proprietary mixes, Sylcrete EV, Sylcrete VA, Optimix, QPR-2000 and EZ Street shall also meet the following stripping tests.

(1) Place 50 grams of cold mix into a beaker containing 400 ml of boiling distilled water. Bring back to boiling and boil for 3 minutes with constant stirring at 1 revolution per second. At the end of 3 minutes, remove the beaker from the heat source and immediately decant the water. Empty the wet mix onto a paper towel and examine. The retained coating shall not be less than 95 percent.

(2) AASHTO T 182 Coating and Stripping of Bitumen-Aggregate Mixtures.

3. INSPECTION. The Engineer or his authorized representative shall have access at any time to all parts of the plant in order to verify weights or proportions and quality of materials used in the preparation of the mixture. The manufacturer shall afford such facilities as may be required for making inspection at the plant and for collecting and forwarding samples of the ingredient materials and bituminous mixture to the Department.

4. PLANT AND EQUIPMENT. Storage facilities and all equipment used in the preparation of the mixture shall be approved by the Department. An approved drier shall be available for surface drying the aggregate when needed. The materials for individual batches shall be measured accurately, either by volume or weight, by approved methods and equipment. A batch type mixer of approved design and capacity shall be used in mixing the ingredient materials. However, approval for the use of a continuous mixer will be given if it can be shown that satisfactory results will be obtained.

5. PREPARATION OF MIXTURE. The aggregate and Optimix, or QPR-2000, or Sylcrete, or UPM, or EZ Street liquid asphalt shall be proportioned into the mixer and mixed for at least 30

seconds or until a uniformly coated mixture is obtained. The liquid asphalt shall be heated to a temperature of 93 °C, ± 28 °C (200º F, ± 50º F), at the time of mixing, and in accordance with the instructions of proprietary mix supplier. When necessary to heat the aggregates, the aggregates should not be heated to more than 68 °C (155 °F).

6. COMPOSITION OF MIXTURE. The ingredients shall be combined to produce a mixture meeting the approval of the Department and conforming to the following composition limits, by weight, as determined by tests of the prepared mixture:

Gradation of Extracted Aggregate (% Passing)[1/]

SIEVE SIZE	OPTIMIX	SYLCRETE EV AND VA			UPM		EZ STREET	
		MIX #1	MIX #2	QPR-2000	MIX #1	MIX #2	MIX #1	MIX #2
12.5 mm (1/2”)	100	100	100	100	100	100	100	100
9.5 mm (3/8”)	90-100	100	90-100	90-100	90-100	100	90-100	95-100
4.75 mm (No. 4)	20-55	85-100	20-55	20-55	15-55	70-100	20-55	80-100
2.36 mm (No. 8)	5-30	10-40	5-30	5-30			5-30	0-10
1.18 mm (No. 16)	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
600 µm (No. 30)		0-7	0-7					0-10
300 µm (No. 50)	0-5	0-5	0-5	0-5			0-5	0-10
75 µm (No. 200)	0-2	0-2.5	0-2.5	0-2	0-4	0-4	0-3	1.5-3.5
Residual Bitumen [2/]	3-6.5	3-6.5	3-6.5	3-7.0	3.5-6.5	3.5-6.5	3-7	3-7

[1/]Based on percent of total aggregate weight.
[2/]Based on percent of total mixture weight.

7. LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC. The laws to be observed; permits and licenses; patented devices; materials, and processes; and responsibility for damage claims, shall be in accordance with the requirements of Section 107 of the above cited Standard Specifications.

This specification is effective March 1, 2005, and supersedes Serial Number M 120-00, effective January 1, 2000.

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